Game Programming

Primary Career Cluster:	Information Technology
Consultant:	Bethany King Wilkes, (615) 532-2844, Bethany.Wilkes@tn.gov
Course Code(s):	5908
Recommended Prerequisite(s):	Computer Programming II (3783/5907), Geometry (3108)
Credit:	1
Grade Level:	12
Aligned Student Organization(s):	Skills USA: www.tnskillsusa.com Brandon Hudson, (615) 532-2804, Brandon.Hudson@tn.gov Technology Student Association (TSA): www.tntsa.org Amanda Hodges, (615) 532-6270, Amanda.Hodges@tn.gov
Teacher Resources:	http://www.tn.gov/education/cte/InformationTechnology.shtml

Course Description

The Game Programming course is intended for students who have displayed a mastery of programming fundamentals such as *HTML* and *Java*. It is project-based where the student explores the entire game production process and gains experience working on a collaborative programming project. At the end of the course, each team of students should have participated in an entire game development cycle resulting in a complete, fully-functional game. *(This course requires a computerized workstation for each student with appropriate* program development tools *and compiler software.)*

Course Standards

Standard 1.0

The student will develop and apply concepts related to human relations, safety, career development, communications, and leadership skills for a global workplace.

The student will:

1.1 Demonstrate sensitivity to personal, societal, corporate, and governmental responsibility to community and global issues.
1.2 Demonstrate the interpersonal, teamwork, and leadership skills needed to function in diverse business settings, including the global marketplace.
1.3 Communicate effectively as writers, listeners, and speakers in diverse social and business

settings.

1.4 Apply the critical-thinking and soft skills needed to function in students' multiple roles as citizens, consumers, workers, managers, business owners, and directors of their own futures.

1.5 Analyze and follow policies for managing legal and ethical issues in organizations and in a technology-based society.

1.6 Investigate the life-long learning skills that foster flexible career paths and confidence in adapting to a workplace that demands constant retooling.

1.7 Assess personal skills, abilities, aptitudes, and personal strengths and weaknesses as they relate to career exploration and apply knowledge gained from individual assessment to research and develop an individual career plan.

1.8 Examine the goals and principles of Future Business Leaders of America.

1.9 Investigate online and office safety procedures and pass a written safety examination with 100% accuracy.

1.10 Demonstrate parliamentary procedure through office staff/chapter organizational meetings.

1.11 Apply appropriate typography concepts to industry documents.

Sample Performance Task

- Design and produce a team project on legal and ethical issues that includes issues and penalties for plagiarism, copied text that does not require permission, and copied data that requires permission and the process used in obtaining permission. Obtain formal permission for use of quotations, art form, design, music, and photographs. Develop and present a total team project utilizing various technology components and appropriate typography concepts.

Standard 2.0

The student will demonstrate an understanding of the history of electronic games and their effects on society (entertainment, education and disabilities).

The student will:

2.1 Investigate notable milestones in the development of electronic games, including platforms, hardware and software changes, and advancements.

2.2 Analyze and critique how society has viewed games/animation in the past and present.

Sample Performance Tasks:

- The student will identify a game that introduced an innovative game play concept and write a paragraph with specific examples of how that innovation influenced later games.

Standard 3.0

The student will demonstrate an understanding of the overall process of game development.

The student will:

3.1 Differentiate between the varied production roles fulfilled by team members on a game development project.
3.2 Apply the concepts of hardware and software development methodologies to game development.

Sample Performance Task

- The student will research and report the duties of a programmer on a game development team.

Standard 4.0

The student will apply game design techniques.

The student will:

4.1 Design rules for complete, working game systems.
4.2 Investigate the rules and dynamics of play in games across a variety of genres.
4.3 Design games using iterative practices, including game prototyping and balancing.
4.4 Analyze and critique design goals in accordance with the target audience and desired response.
4.5 Design interfaces that communicate appropriate game information using the principles of human-computer interaction.
4.6 Analyze and construct the flow of game events, including the cycle of interaction between the player and the game.
4.7 Synthesize the creative elements of a game, including characters, themes, settings, and plots, with game systems.

Sample Performance Task

- The student will create and document an original game design using only ten cards numbered from one to ten.

Standard 5.0

The student will demonstrate the acquisition of programming skills essential to the development of games. *(CLE 3102.1.7, CLE 3102.2.1, CLE 3102.3.6, CLE 3102.3.1, CLE 3102.3.5, CLE 3102.3.6, CLE 3102.3.9, CLE 3103.1.7, CLE 3103.2.3, CLE 3108.1.7.)*

The student will:

5.1 Synthesize the talents of a multi-disciplinary team to complete the development of an electronic game. Design and create an interactive program that implements graphics and sound. *(CLE 3102.1.2, CLE 3102.5.1, CLE 3102.5.2, CLE 3101.1.2, CLE 3103.2.4, CLE 3103.3.2, CLE 3103.3.5, CLE 3103.5.1, CLE 3103.5.2, CLE 3103.5.3, CLE 3103.5.4, CLE 3108.1.2, CLE 3108.2.3, CLE 3108.5.1.)*
5.2 Investigate relevant external application programming interfaces and use them where appropriate.

5.3 Apply the concepts of probability and statistics to various aspects of game systems and environments. *(CLE 3102.1.2, CLE 3102.5.1, CLE 3102.5.2, CLE 3101.1.2, CLE 3103.2.4, CLE 3103.3.2, CLE 3103.3.5, CLE 3103.5.1, CLE 3103.5.2, CLE 3103.5.3, CLE 3103.5.4, CLE 3108.1.2, CLE 3108.2.3, CLE 3108.5.1.)*

5.4 Apply the concepts of coordinate systems, vectors, and Newtonian motion to objects in game environments.

5.5 Acquire mastery of advanced programming concepts as needed to complete projects.

Sample Performance Task

- The student will communicate and collaborate with team members in developing a game using graphical techniques, essential mathematics, collision detection, input device detection and response, sound playback, scene management, animation, and model/character loading and drawing.

Standard 6.0

The student, based on an understanding of the importance of testing, will implement plans to test for both functionality and usability and develop strategies for performing both.

The team will:

6.1 Design plans for testing software for errors and features not built to specifications

6.2 Design plans for analyzing the results of usability testing.

6.3 Periodically run assessments on the functionality and usability of the product.

Sample Performance Task

- Design and program a maze game that uses a stack in order to back track moves.
- The student will expand upon and customize the team game and add unique features.